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EXAMINER

CORNO JR, JAMES A

ART UNIT

PAPER NUMBER

1793

NOTIFICATION DATE

DELIVERY MODE

10/14/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@mwzb.com

DETAILED ACTION

Response to Arguments

Applicant's arguments, see page 6, filed May 21, 2009, with respect to the rejection(s) of claim(s) 1-7 under 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Koster et al. (US Patent No. 6,872,865), Stockwell et al. (US Patent No. 5,082,814), and Twaiq et al. (*Fuel Processing Technology* **85**(11), p. 1283-1300, available online Dec. 2003).

Applicant asserts that the coated zeolites of Koster are larger than the newly claimed size limitations allow. However, it should be noted that the passage describing particles 200 microns in diameter (col. 7, lines 61-67) is actually referring to an agglomeration of the coated zeolite particles. The coated particles themselves (referred to as composite particles by Koster) are described as preferably having a diameter from 1-50 microns (col. 4, lines 56-58). In addition, the coating itself (referred to as a mantle by Koster) is described as preferably having a thickness less than the diameter of the core particle (col. 4, lines 53-55).

Applicant argues that Stockwell and Twaiq are directed to different inventions and are therefore not properly combined with Koster. However, all three references are directed to catalysts comprising a zeolite core with a porous coating. The details of the coatings do not take away from the teachings of the secondary references, which clearly indicate that coating uniformity plays an important role in the activity at the core.

The rejections were overcome by amendments including size limitations on the coating thickness. The new rejections presented below were therefore necessitated by amendment and are made final.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 6-13, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koster et al. (US Patent No. 6,872,865) in view of either of Stockwell et al. (US Patent No. 5,082,814) or Twaiq et al. (*Fuel Processing Technology* **85**(11), p. 1283-1300, available online Dec. 2003). Koster teaches aluminosilicate zeolite cores coated in boralite (Abstract), in which the particles are on the order of 1 μm in diameter (Figures). Both boralite and ZSM-5, the preferred zeolite core material, are microporous crystalline materials with pores on the order of 0.5 nm in diameter. Koster also teaches that the core may be modified for use in dehydrocyclization reactions by making it non-acidic, implying the cores are otherwise acidic (col. 8, lines 59-62). Koster does not teach the shell thickness uniformity of the instant claims. However, it is well known in the art that shell thickness in zeolite catalysts with porous coatings affects both selectivity and reaction rates (see Stockwell, col. 2, line 40 – col. 3, line 2; or Twaiq,

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Table 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to make the coating as uniform as possible in order to yield consistent results.

Koster does not teach that the coating thickness should be between 0.1 and 10 μm . However, Koster indicates that the thickness is ideally less than the diameter of the core particle (col. 4, lines 53-55) and that the total particle diameter should be from 1-50 microns (col. 4, lines 56-58).

Koster and the claims differ in that Koster does not teach the exact same dimensions as recited in the instant claims.

However, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the dimensions taught by Koster overlap the instantly claimed dimensions and therefore are considered to establish a prima facie case of obviousness. It would have been obvious to one of ordinary skill in the art to select any portion of the ranges disclosed in the prior art reference, including the instantly claimed ranges, particularly in view of the fact that;

“The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages”, In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

Regarding claim 2, Koster does not teach what fraction of the core surface is covered by the outer layer. However, because the outer layer is necessary to control

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selectivity, it would have been obvious to one of ordinary skill in the art at the time of the invention to coat the entire surface of the core in order to maximize selectivity.

Regarding claim 3, Koster teaches aluminosilicate cores and boralite shells, which have different chemical compositions.

Regarding claims 6, 16, and 17, boralite has pores approximately 0.5 nm in diameter.

Regarding claim 7, both the aluminosilicates and boralite are zeolites.

Regarding claims 8-12, it would have been obvious to one of ordinary skill in the art at the time of the invention to maximize uniformity for each particle.

Regarding claim 13, Koster does not teach what fraction of the core surface is covered by the outer layer. However, because the outer layer is necessary to control selectivity, it would have been obvious to one of ordinary skill in the art at the time of the invention to coat the entire surface of the core in order to maximize selectivity.

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koster in view of either of Stockwell or Twaiq as applied to claim 1 above, and further in view of van den Berge et al. (US 2003/0127360 A1). Koster does not teach the claimed combination of zeolites. Van den Berge teaches that many of such combinations are useful, including zeolite Y, beta zeolite, and silicalite as either the core or shell. One of ordinary skill in the art at the time of the invention could have selected any combination of these zeolites with a reasonable expectation of success.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **JAMES CORNO** whose telephone number is (571)270-5829. The examiner can normally be reached on Monday-Thursday 9:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/JAMES CORNO/
Examiner, Art Unit 1793

October 7, 2009

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793